

We claim:

1. A method of differential quantization in video coding of a coded video bit stream, comprising:

- 5 analyzing motion vectors of macroblocks for a frame of a video sequence to estimate global motion of the video at the frame in the video sequence;
 classifying regions of the frame according to perceptual significance based on the global motion estimate;
 differentially quantizing the regions according to their perceptual significance
10 classification in coding a compressed bit stream of the video sequence;
 signaling different quantization of the regions in the compressed bit stream, wherein the signaled different quantization includes signaling different quantization strength for macroblocks in a region on at least one boundary edge of the frame;
 reading the signaled different quantization from the compressed bit stream; and
15 dequantizing the macroblocks of the frame according to the signaled different quantization.

2. The method of claim 1 wherein the signaling different quantization uses a syntax that includes coding a frame level quantization strength and an alternative
20 quantization strength coded as a difference from the frame level quantization strength.

3. The method of claim 1 wherein the signaling different quantization uses a syntax that includes coding the region to be any of left, right, top, or bottom boundary edges.
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4. The method of claim 1 wherein the signaling different quantization uses a syntax that includes coding the region to be any of adjacent pairs of left, right, top, and bottom boundary edges.

5. The method of claim 1 wherein the signaling different quantization uses a syntax that includes coding the region to be any of a single boundary edge, and a pair of adjacent boundary edges.

5 6. The method of claim 1 wherein the signaling different quantization uses a syntax that includes coding the region to be any of a single boundary edge, a pair of adjacent boundary edges, and all four boundary edges.

7. The method of claim 1 wherein the signaling different quantization uses a
10 syntax that includes coding the region to be any of a single boundary edge, a pair of adjacent boundary edges, all four boundary edges, and all macroblocks individually.

8. A video decoder comprising:
an inverse quantizer for dequantizing coded macroblocks of a frame in a video
15 sequence encoded in a compressed video bit stream;
a side information decoder for reading side information encoded apart from compressed video content in the compressed video bit stream according to a syntax scheme, wherein the side information includes information of differential quantization applied to macroblocks of the frame in regions classified according to a global motion
20 estimation for the frame; and
a dequantization controller for controlling a quantization strength applied by the inverse quantizer in dequantizing individual macroblocks of the frame in accordance with the decoded side information of differential quantization of the respective macroblocks.

25 9. The video decoder of claim 8 wherein the syntax scheme identifies regions classified as having less visual significance due to the global motion estimation being indicative of panning.

10. The video decoder of claim 8 wherein the syntax scheme identifies regions classified as having less visual significance due to the global motion estimation being indicative of zooming.

5 11. The video decoder of claim 8 wherein the syntax scheme identifies a differently quantized region to be from among a list of coding possibilities that comprises a single boundary edge and a pair of adjacent boundary edges of the frame.

12. The video decoder of claim 8 wherein the syntax scheme identifies a
10 differently quantized region to be from among a list of coding possibilities that comprises a single boundary edge, a pair of adjacent boundary edges, and all boundary edges of the frame.

13. The video decoder of claim 8 wherein the syntax scheme identifies a
15 differently quantized region to be from among a list of coding possibilities that comprises a single boundary edge, a pair of adjacent boundary edges, all boundary edges, and all macroblocks separately.

14. The video decoder of claim 8 wherein the syntax scheme includes a frame
20 level quantization strength and a second quantization strength.

15. The video decoder of claim 14 wherein the second quantization strength is coded relative to the frame level quantization strength.

25 16. A computer-readable program carrying medium having a computer-executable software carried thereon for executing on a computer to decode a differential quantization coded video bit stream, the program comprising:

 programming instructions for reading differential quantization information signaled in the coded video bit stream according to a syntax scheme, wherein the syntax
30 scheme represents a different quantization strength of at least a region of macroblocks in

a frame of video than other macroblocks of the frame classified as having less perceptual significance based on global motion analysis; and

programming instructions for dequantizing macroblocks of the frame at the different quantization strengths in accordance with the differential quantization
5 information read from the coded video bit stream.

17. The computer-readable program carrying medium of claim 16 wherein the syntax scheme includes region identification coding for a variety of regions classifiable as less perceptually significant due to panning and zooming.

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18. The computer-readable program carrying medium of claim 16 wherein the syntax scheme codes the region from a choice of a single boundary edge and a pair of adjacent boundary edges of the frame.

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19. The computer-readable program carrying medium of claim 16 wherein the syntax scheme codes the region from a choice of a single boundary edge, a pair of adjacent boundary edges, and all boundary edges of the frame.

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20. The computer-readable program carrying medium of claim 16 wherein the syntax scheme codes the region from a choice of a single boundary edge, a pair of adjacent boundary edges, all boundary edges, and all macroblocks separately.

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21. The computer-readable program carrying medium of claim 16 wherein the syntax scheme includes a frame level quantization strength and the different quantization strength.

22. The computer-readable program carrying medium of claim 21 wherein the different quantization strength is coded relative to the frame level quantization strength.

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